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Press Release

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USNO DEDICATES NEW MASTER CLOCK FACILITY

On November 7, 2008, the United States Naval Observatory (USNO), with the help of the Vice President of the United States, formally dedicated its new Master Clock Facility, which will be the repository of the most accurate time-scale available in the world. Within the walls of the new building the Observatory's Time Service Department will install and maintain the world's largest collection of "atomic clocks", including three next-generation Rubidium Atomic Frequency Fountain clocks which, together with dozens of Cesium-beam and Hydrogen maser clocks, will keep time so accurately that the system will not gain or lose more than one second in 30 million years.

The new facility, built by the Whiting-Turner Contracting Company under the supervision of Naval Facilities and Engineering Command, Washington, incorporates an elaborate environmental control system to keep the clocks in strictly regimented temperature and humidity conditions. The building's temperature will be regulated to +/- 0.1°C and its humidity will be controlled to within a 3% tolerance.

The Honorable John G. Grimes, Assistant Secretary of Defense for Networks and Information Integration / Chief Information Officer, was the keynote speaker for the dedication. In his remarks, Mr. Grimes said: "As the Chairman of the Department's senior leadership body on Positioning, Navigation, and Timing (PNT), I am acutely aware of the importance of precise time for DoD operations. From the onset of locating a threat, to placing a weapon on target, and subsequently evaluating the success of this engagement - all are impacted by the precision of time. And nowhere is this more important than here, where time is generated and maintained. For this reason, I look to the Naval Observatory to be my primary focal point within DoD for all timing related issues.

"I cannot emphasize enough how important it is that we have one time standard within the Department; the Naval Observatory Master Clock is this Standard. For without this Standard, operations will fail. This time standard is vital for data fusion of intelligence information, proper operation of the Global Positioning System (GPS), reliable network performance, consistent and secure communications, and maintaining the critical national infrastructure. Not only does GPS rely heavily on the timing operations at USNO, but it is the primary means for promulgating the precise time generated here at this Master Clock. This new facility and associated clocks will enable GPS III to meet the future timing objectives."

The U.S. Naval Observatory has been keeping time for the Department of the Navy and for the Nation since the year 1845, when Superintendent Matthew F. Maury first put the Washington Time Ball into operation. Timekeeping procedures and technology have evolved dramatically since that time and the U.S. Naval Observatory Time Services Department has aggressively developed new timing methods and timekeeping equipment to meet increasingly rigorous requirements.

The Observatory's current Master Clock ensemble consists of roughly one-third of the world's operational atomic clocks and correspondingly accounts for one-third the weight of Universal Coordinated Time (UTC). The new Master Clock Facility will house three of the most precise clocks ever built, the USNO's Rubidium Atomic Frequency Fountain devices. At the heart of each of these clocks is a small, spherical vacuum chamber where Rubidium atoms are trapped and cooled by laser radiation until they are so cold that the random motions of the individual atoms essentially cease. The cooled atoms are then launched in a lazy arc into a microwave cavity, where their natural resonance frequency can be measured and counted. Precision counting of the oscillations of any physical system is what we use to define a "clock". These clocks oscillate over six billion times per second, and their frequency and stability can be recorded to a precision measured in fractions of a trillionth of a second.

The new USNO Master Clock facility, with its advanced Atomic Frequency Fountains, assures the DoD and U.S. global supremacy in time will be maintained well into the future. USNO will thus remain the Gold Standard for global precision timing.

Note to editors: Digital images of the new Master Clock Facility and the Rubidium Atomic Frequency Fountain clock may be obtained by contacting the USNO Public Affairs Office.